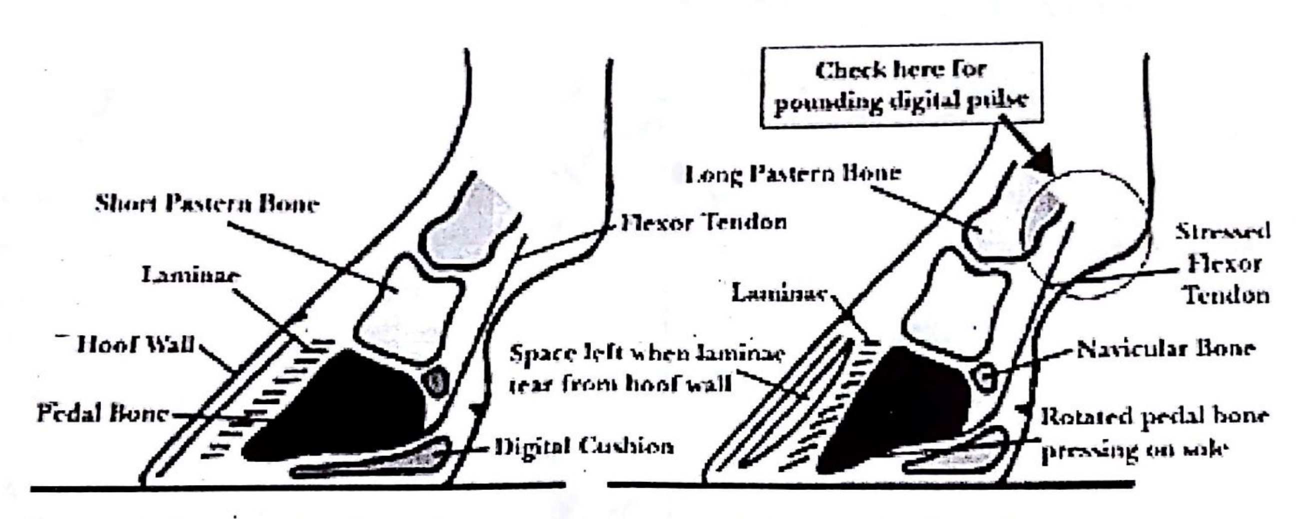
Equine Laminitis

1



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Equine Laminitis

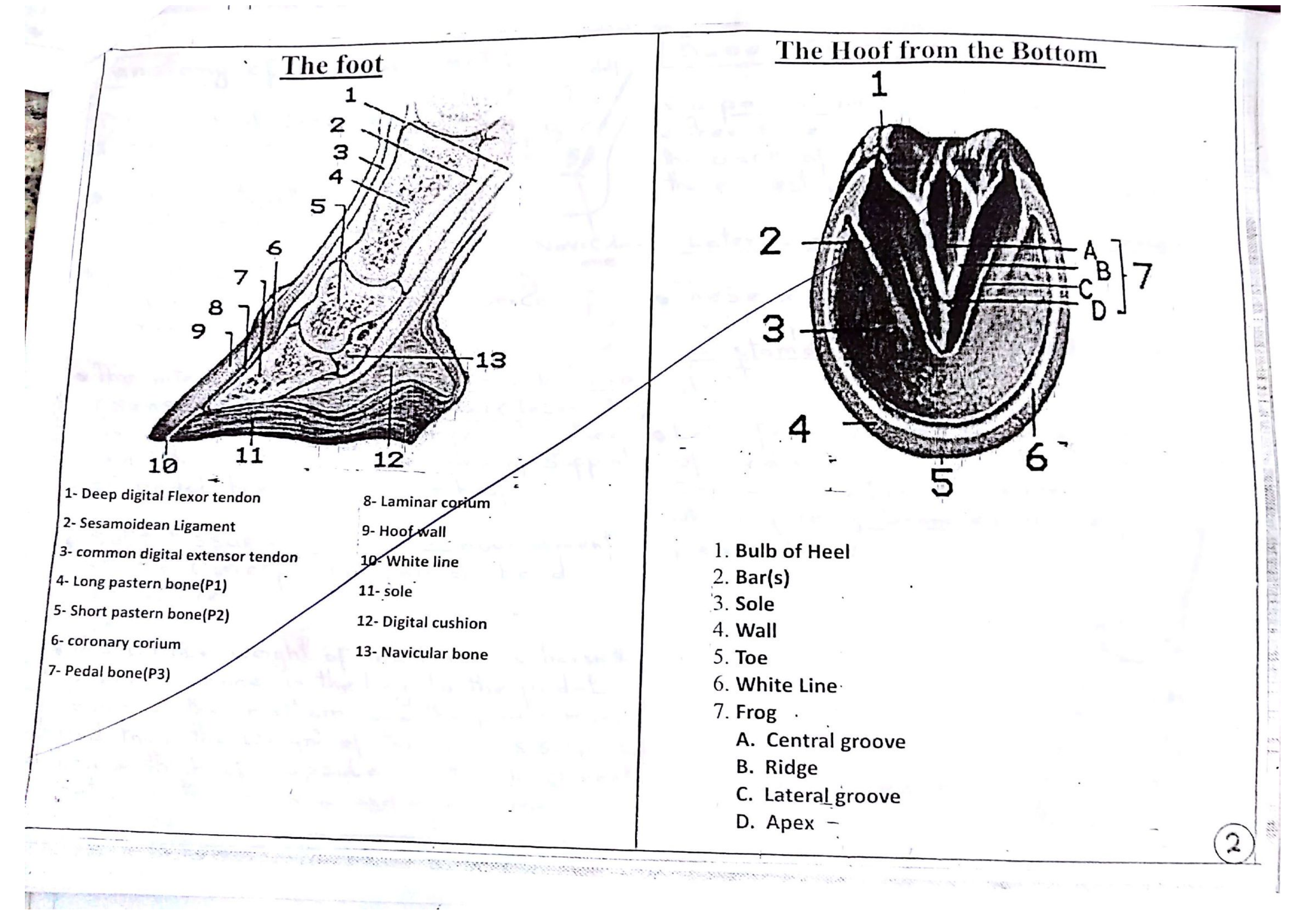
- It is one of the most Common Causes of Lameness and disability affecting horses and also in Cattle.
- Laminits remains the second Largest Killer of horses behind Colic.
- Inflammation of Laminae is "gross oversimplification of Laminitis" → but, it is a Complex disease involving multiple body systems (Cardiovascular, renal, endocrine, blood Coagulation, acid-base) → major manifestation of the disease occurs in the Foot.
- It is a disease associated with ischemia of the digital dermal tissue and it is not primarily an inflammatory disease.

Failure of attachement between the dermal and epidermal Laminae.

he animal appear as walking on fire on egg shells.

- There are some disease Condition which predispose the animal to Laminitis, however most of the Cases are man-made due to bad husbandry practice
- Founder is Considered the F-words in musculoskeletal disorders of equine.
- 75 % of Laminitis Cases Could get the horse out of its Career or they may be euthanized.

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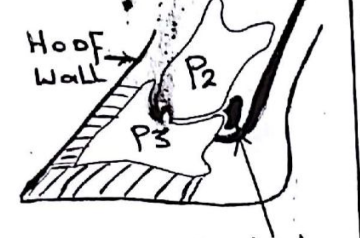
The foot

1- Deep digital Flexor tendon
2- Sesamoidean Ligament
3- common digital extensor tendon
4- Long pastern bone(P1)
5- Short pastern bone(P2)
6- coronary corium
7- Pedal bone(P3)
8- Laminar corium
9- Hoof wall
10- White line
11- sole
12- Digital cushion
13- Navicular bone

The Hoof from the Bottom

1. Bulb of Heel
2. Bar(s)
3. Sole
4. Wall
5. Toe
6. White Line
7. Frog
   A. Central groove
   B. Ridge
   C. Lateral groove
   D. Apex

anatomy of normal foot:



1. Horny hoof Capsule
2. pedal bone

- are held together by <u>Soft tissue Corium.</u>
- presence of pedal bone in horny hoof Capsule LookLike presence of human Leg in shoes.
- The interLocking between <u>dermal Laminae (sensitive)</u> and <u>epidermal one (Insensitive)</u> as you sLotting your fingers together and this is the onLy means of support of pedal bone within the hoof.
- <u>Soft tissue (Corium)</u> → nourishment of the Corresponding part of hard structure.
- The whole weight of the horse is transmitted down the bone in the Leg to the pedal bone at the bottom → the pedal bone and thus the weight of the horse is suspended inside the hoof Capsule by <u>the attachment between the dermal and epidermal Laminae</u>

Blood supply of the foot:

<u>Via paired digital arteries</u> → one on either side of the Leg, emerge around the back of the fetLock joint which is the easiest place to take <u>digital pulsation</u>

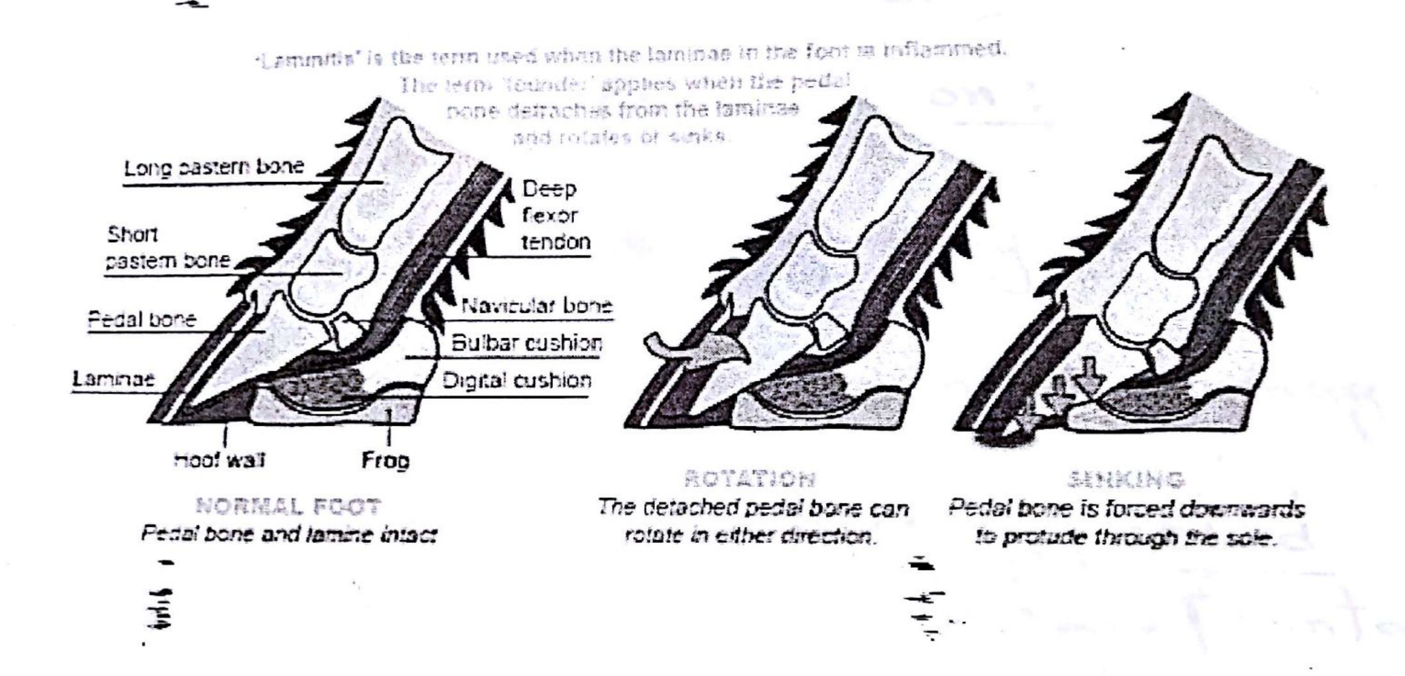
<u>Lateral and medial digital arteries</u>

- These 2 digital arteries go down to Level of pastern joint and make <u>anastomotic arch</u> at Level of pastern joint.
- Enter from 2 opening at Caudal aspect of pedal bone → then to <u>semiLunar CanaL</u> → forming terminal arch which give 9 <u>branches</u> inside pedal bone.

Blood supply of the foot is directed in upward direction

Lamitis

2



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• Why Lack of blood supply Leads to pain in Laminitis ?

Lack of blood supply → Lack of oxygenation of cells → affect end artery in soft tissue → severe pain.

→ Reperfusion again (blood restored) → Lead to pain.

→ It indicate that Laminitis is not an inflammatory Condition.

• Severe and Long reduction in foot blood supply

→ failure of attachment between pedal bone and hoof capsule → as there is an insufficient area of healthy Laminar Corium Left to support pedal bone (damage of attachment between dermal Laminae and epidermal Laminae)

Clinical Signs :

Pathology تشكيل جواد =

(1) acute Laminitis (Founder):

العظم يلف للأسفل ولورا

affected area of pedal bone is front Laminar Corium → weakened support of pedal bone → downword and backward movement → stretching of dermal and epidermal Laminae → pulled apart.

بيبعدوا عن بعض

بيسيبوا بعض خالص

prognosis:

depend on

1. severity of Case
2. rotation
3. degree of ditch depression
4. state of SoLe (Concave - Plate - Convex)
5. presence of notch (Roughness)

Vary from Favorable to guarded.

- 30% return to Soundness (مكانها الطبيعي)
- 10% intermittently Lame
- 10% permenantly Lame
- 50% death

The problem with Laminitis:

→ within the multitude of treatment options
→ None are universally effective.

→ pathogenesis is poorly understood → Contradicting theories (Heat Vs Cold "Icy therapy")

Treatment of Laminitis:

goals of treatment:

1. prevent further development
2. Reduce the pain or hypertension Cycle
3. ↓ or prevent permenant Laminar damage
4. improve Laminar Capillary dynamics.
5. prevent movement of distal phalanx.

Triangle of treatment of Laminitis → Vet. / Farrier / owner

(1) Medicinal treatment :

(a) pain Killer drugs → as detomidine

(b) Vasodilators → dimethyl sulphoxide (DMSO), pentoxifylline, acepromazine, Isoxuprine, Nitrovasodilators.

Ischemia

(c) anti-blood clotting

e.g heparin 40 Iu / Kg

(d) NSAIDS (prostaglandin synthesis inhibitors)

Such as →
- Flunixin meglumine (Finadyne)
- phenylbutazone
- Methyl salicylate (aspirin per os)
- Metakan
- Meloxicam
- anticox -1, 2

(e) antihypertensive → K, Methionine and cystein supplementation.

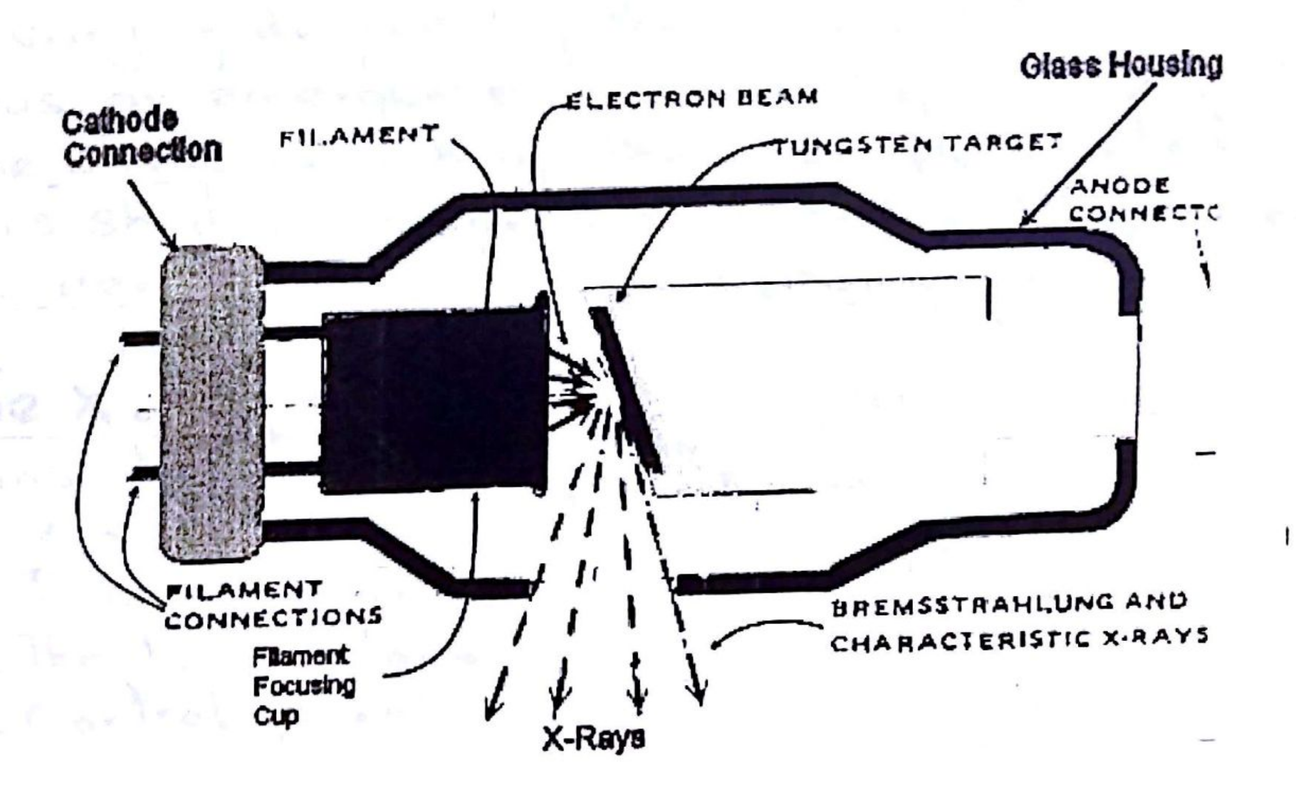
(F) Treatment of acute Laminitis with α-adrenogenic blockers such as phenoxybenzamine and phenothiazine derivatives.

(G) Fluid replacement → till 40 L

(H) Fish oil supplement → very important

Radiology

1

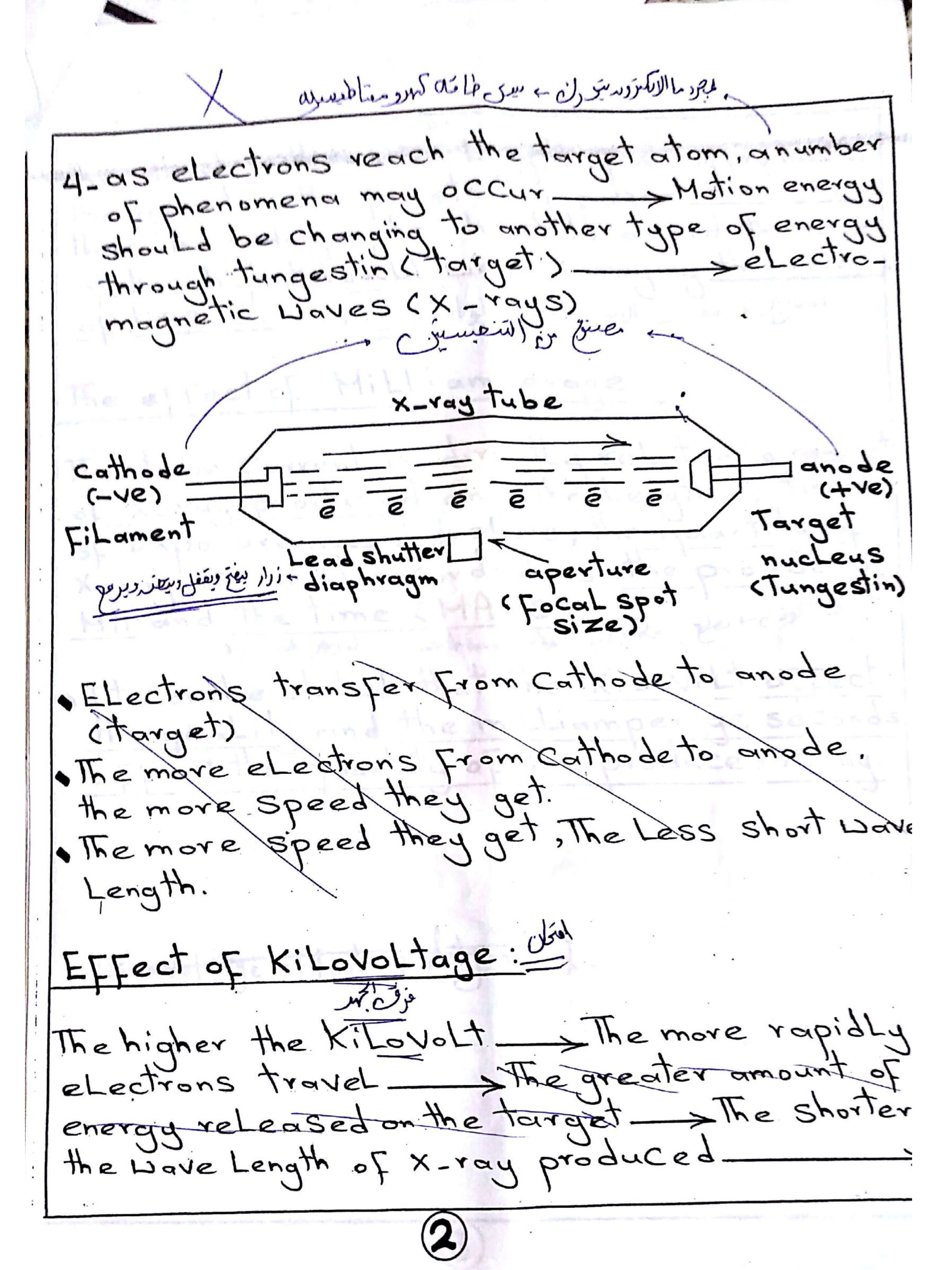


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مجرد ما الالكترون يتحرك ← بيدي طاقة كهرومغناطيسيه

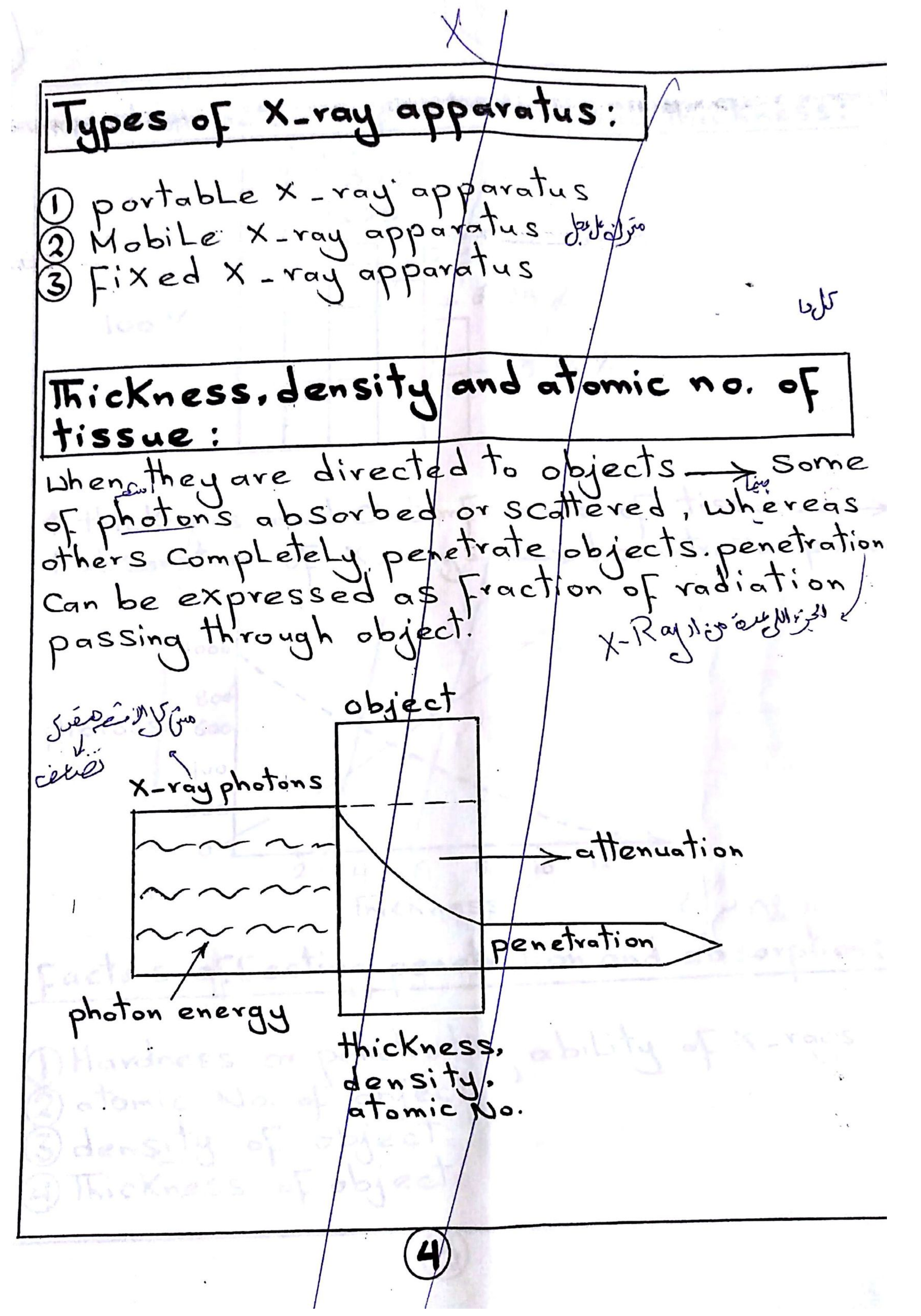
4- as electrons reach the target atom, a number of phenomena may occur ⟶ Motion energy should be changing to another type of energy through tungestin (target) ⟶ electro-magnetic waves (X-rays).

- Electrons transfer from Cathode to anode (target)
- The more electrons from Cathode to anode, the more speed they get.
- The more speed they get, The less short wave Length.

Effect of KiLoVoLtage: امتحان

فرق الجهد

The higher the KiLoVoLt ⟶ The more rapidly electrons travel ⟶ The greater amount of energy released on the target ⟶ The shorter the wave Length of X-ray produced ⟶



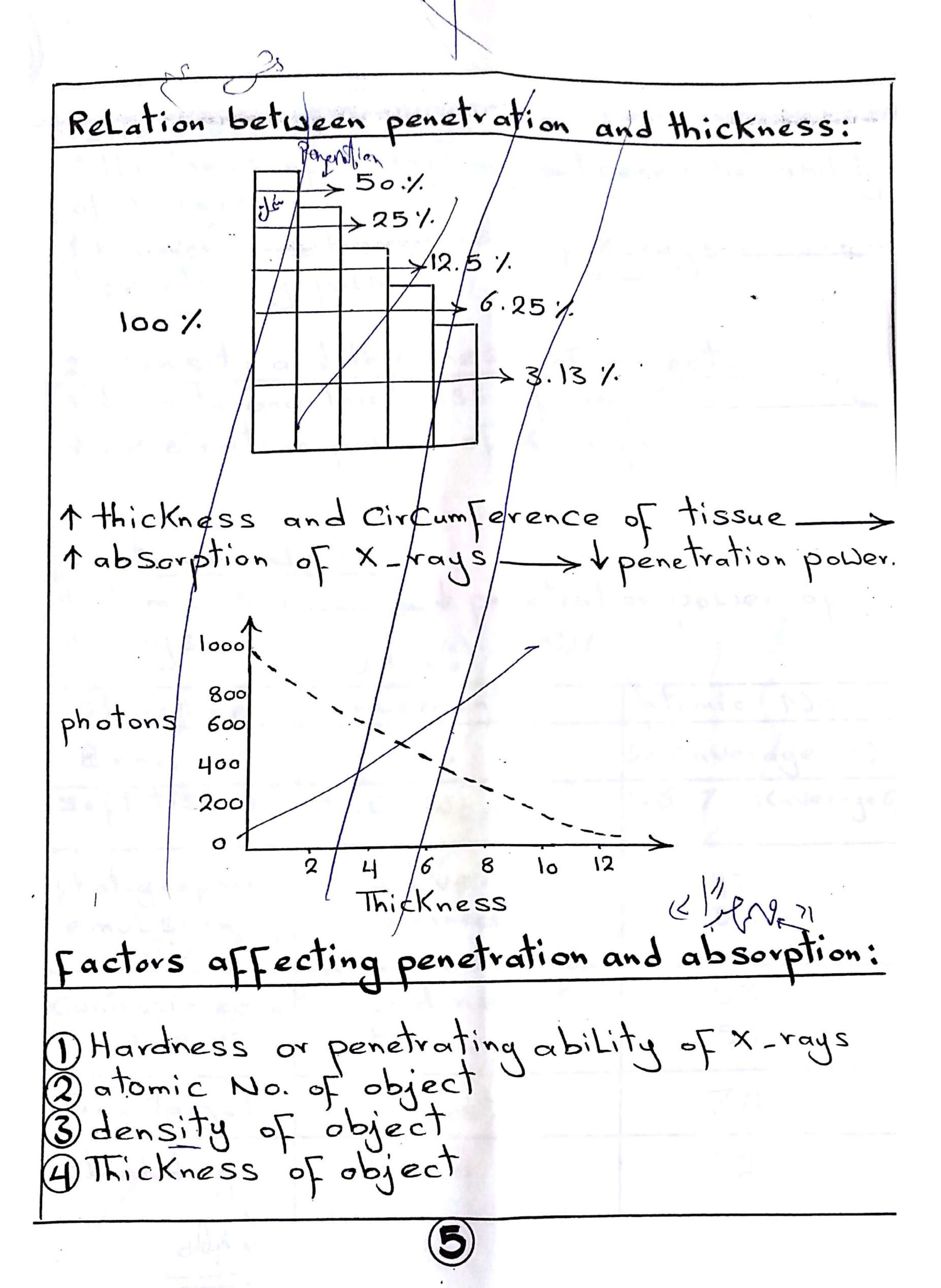
Types of X-ray apparatus:

1. portable X-ray apparatus
2. Mobile X-ray apparatus متحرك على عجل
3. Fixed X-ray apparatus

Thickness, density and atomic no. of tissue:

When they are directed to objects → some of photons absorbed or scattered, whereas others completely penetrate objects. penetration can be expressed as fraction of radiation passing through object.

الجزء اللي يمر من الـ X-Ray



Relation between penetration and thickness:

↑ thickness and Circumference of tissue → ↑ absorption of X-rays → ↓ penetration power.

Factors affecting penetration and absorption:

1. Hardness or penetrating ability of X-rays
2. atomic No. of object
3. density of object
4. Thickness of object

1_Hardness of X_rays:

↑ Hardness of X_rays ⟶ ↑ penetration ability of X_rays.

↑ KiLoVolt ⟶ ↑ hardness of X_rays ⟶ ↑ penetrating power.

2_density and thickness of object:

↑ density and thickness of object ⟶ ↓ penetration power of X_rays

3_atomic No. :

↑ atomic No. ⟶ ↓ penetration power of X_rays.

مثاليسر واعلب

واسعر كل الاشعة

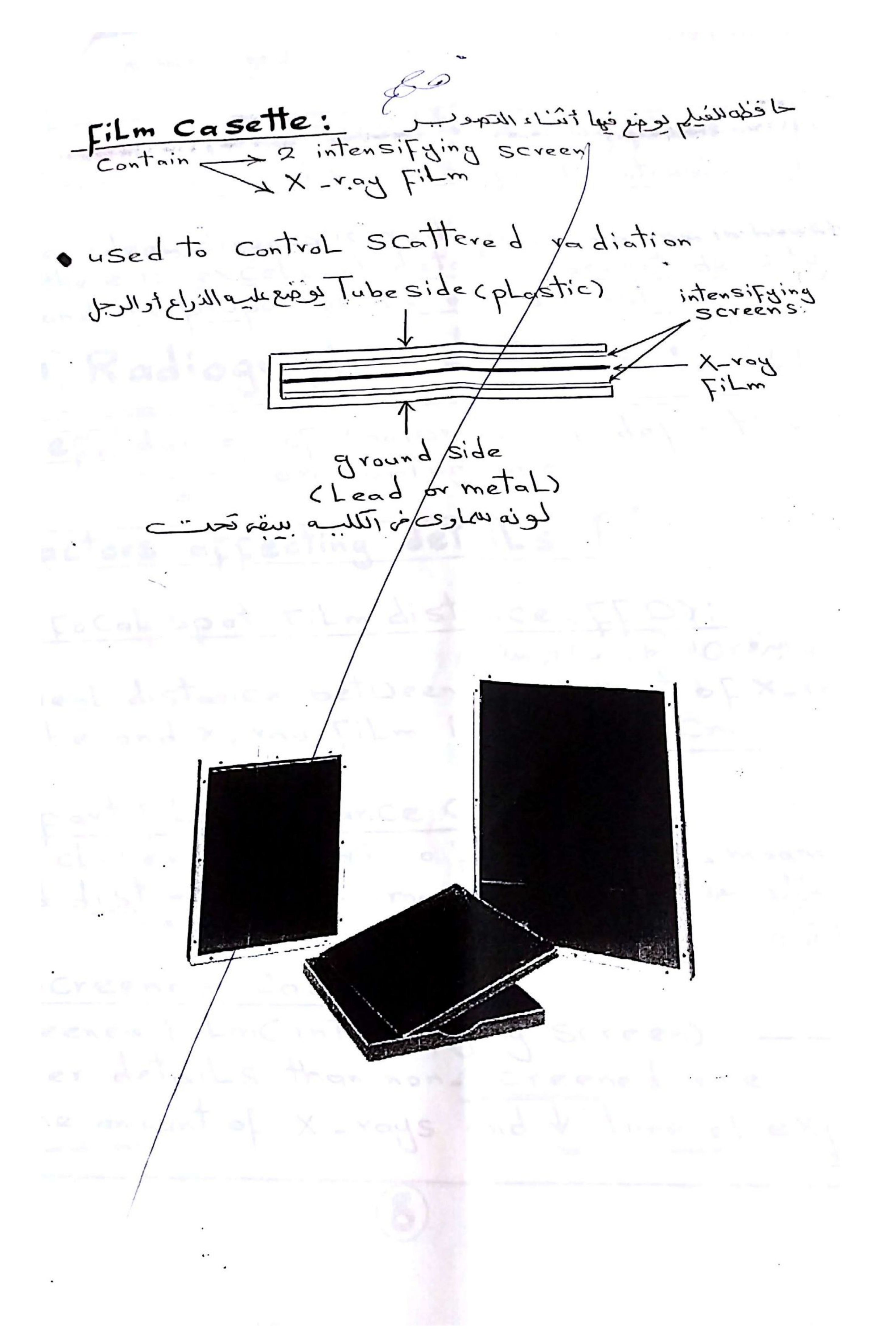
structure	element	atomic No.
Bone	Ca	20 (average 14)
soft tissue	H_2, C, N_2, O_2	1, 6, 7, 8 (average 6)
photographic emulsion المادة اللي على فيلم الاشعة	silver bromide	47 35
Contrast media لي اشعة الصبغة	Iodine Barium	53 56
Tube target	Tungestin	74
shielding	Lead	82

لي البطانة

Film Casette: حافظه الفيلم يوضع فيها أثناء التصوير

Contain → 2 intensifying screen
→ X-ray Film

- used to control scattered radiation



→ X-Ray film should be in direct Contact with intensifying screen above & below

4- Film screen Contact:

If x-ray film not in direct Contact with the entire surface of both screens above and below → fluorescence of energized crystals on the screen will cause a much larger reflection on the radiograph.

5_ Correct exposure:

over exposure (too dark) or under exposure (too light) affect detail

تحميض الفيلم

6_ Radiographic processing:

- Error in development → is the major cause of poor details.
- 5 minutes developing period and 24°C constant temperature are advised.

درجة الحرارة عند ٢٤°C

7- Focal spot size:

- smaller → better detail
- ↑ size → scattered radiation

Scanned by CamScanner

dark room, equipment and Radiographic processing

- The Correct processing of the radiograph is the Key factor to good radiograph.
- The result of careful radiography Can be nullified in seconds by improper processing.

don't expect to be radiologist at end of Lecture!!

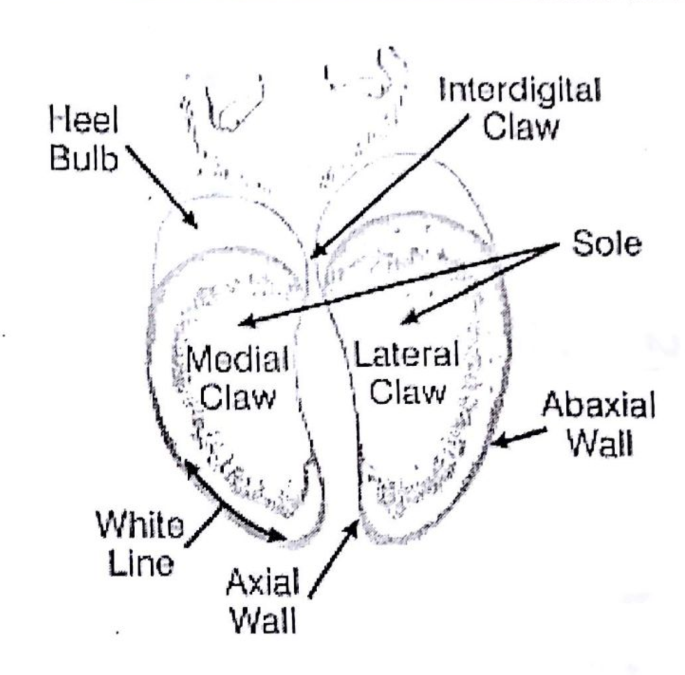
Basic radiographic opacities

- Radiographic image is obtained when X-rays goes through body parts.
- penetration and absorption of X-rays depend on
  - → penetrating ability of X-ray
  - → thickness of the matter
  - → density of the matter
  - → atomic No. of the matter

Black ——————→ White

air, Fat, soft tissue, Bone, Metal + contrast

Claw affections

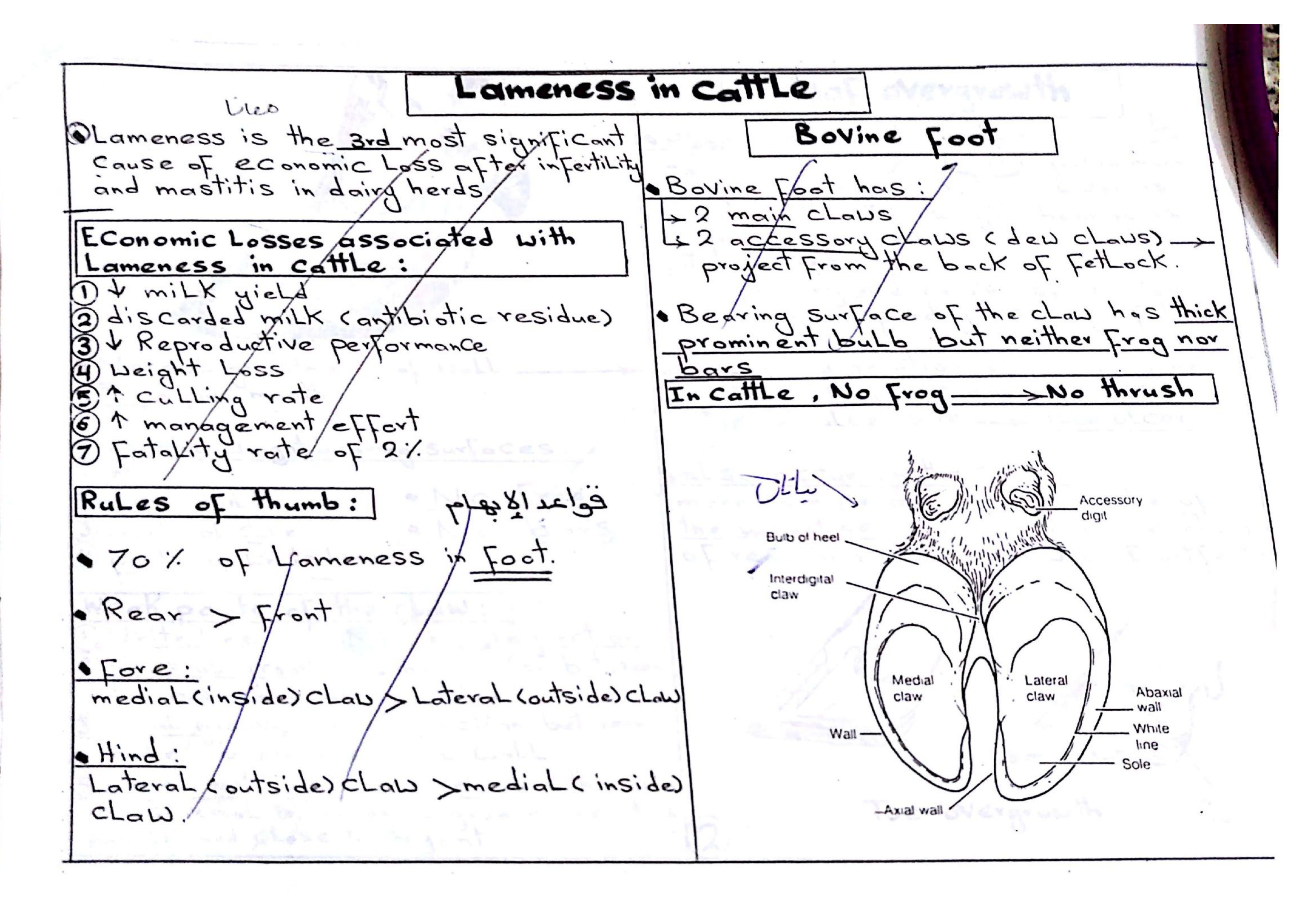


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Lameness in cattle

- Lameness is the 3rd most significant cause of economic Loss after infertility and mastitis in dairy herds.

Economic Losses associated with Lameness in cattle:

1. ↓ milk yield
2. discarded milk (antibiotic residue)
3. ↓ Reproductive performance
4. Weight Loss
5. ↑ culling rate
6. ↑ management effort
7. Fatality rate of 2%

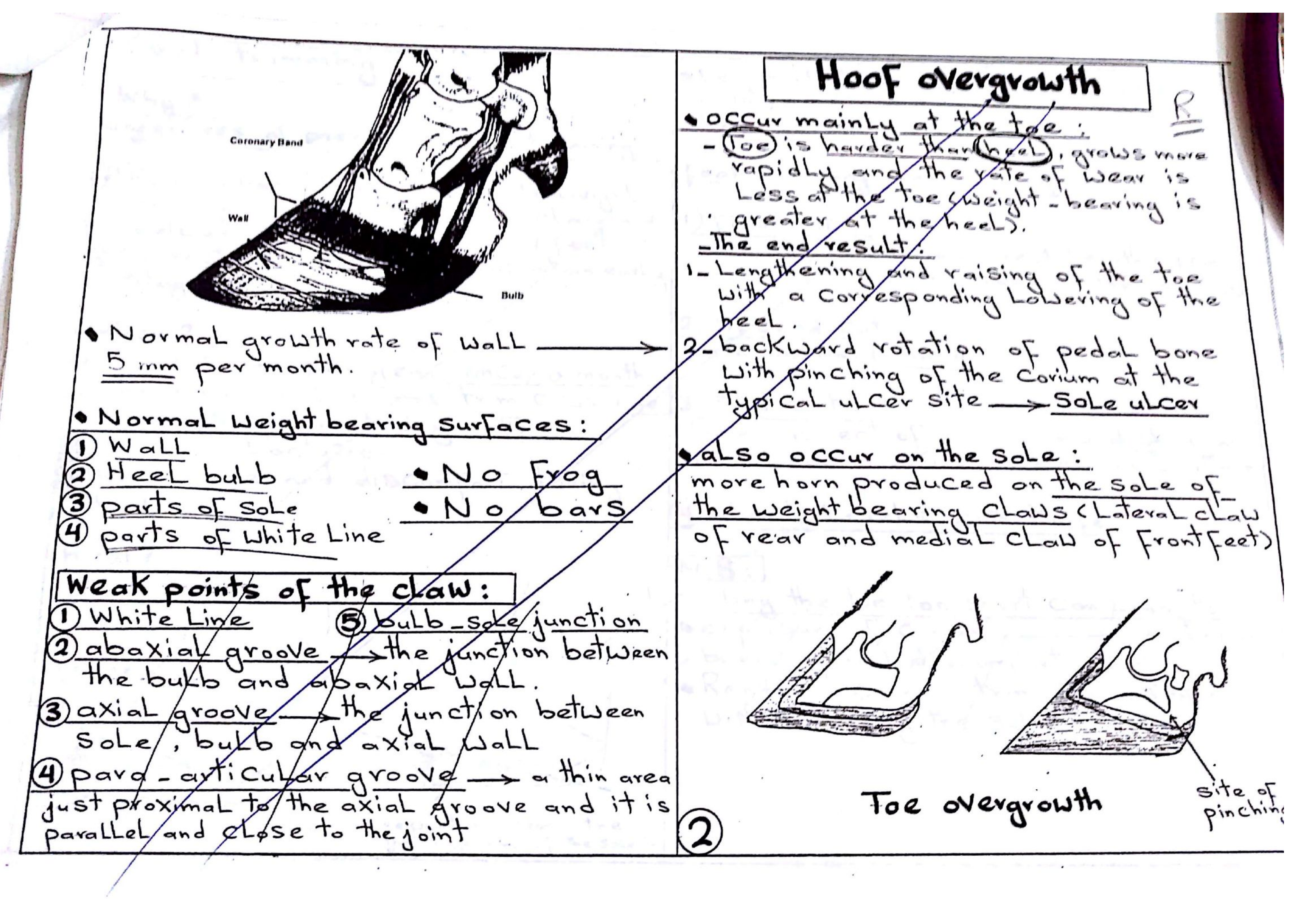
Rules of thumb: قواعد الإبهام

- 70% of Lameness in foot.
- Rear > front
- Fore:
  medial (inside) claw > Lateral (outside) claw
- Hind:
  Lateral (outside) claw > medial (inside) claw.

Bovine foot

- Bovine foot has:
  - → 2 main claws
  - ↳ 2 accessory claws (dew claws) → project from the back of fetlock.
- Bearing surface of the claw has thick prominent bulb but neither frog nor bars

In cattle, No frog ⟶ No thrush



- Normal growth rate of wall → 5 mm per month.

- **Normal weight bearing surfaces:**

1. Wall
2. Heel bulb
3. parts of sole
4. parts of white line

- No frog
- No bars

Weak points of the claw:

1. White line
2. abaxial groove → the junction between the bulb and abaxial wall.
3. axial groove → the junction between sole, bulb and axial wall
4. para-articular groove → a thin area just proximal to the axial groove and it is parallel and close to the joint
5. bulb-sole junction

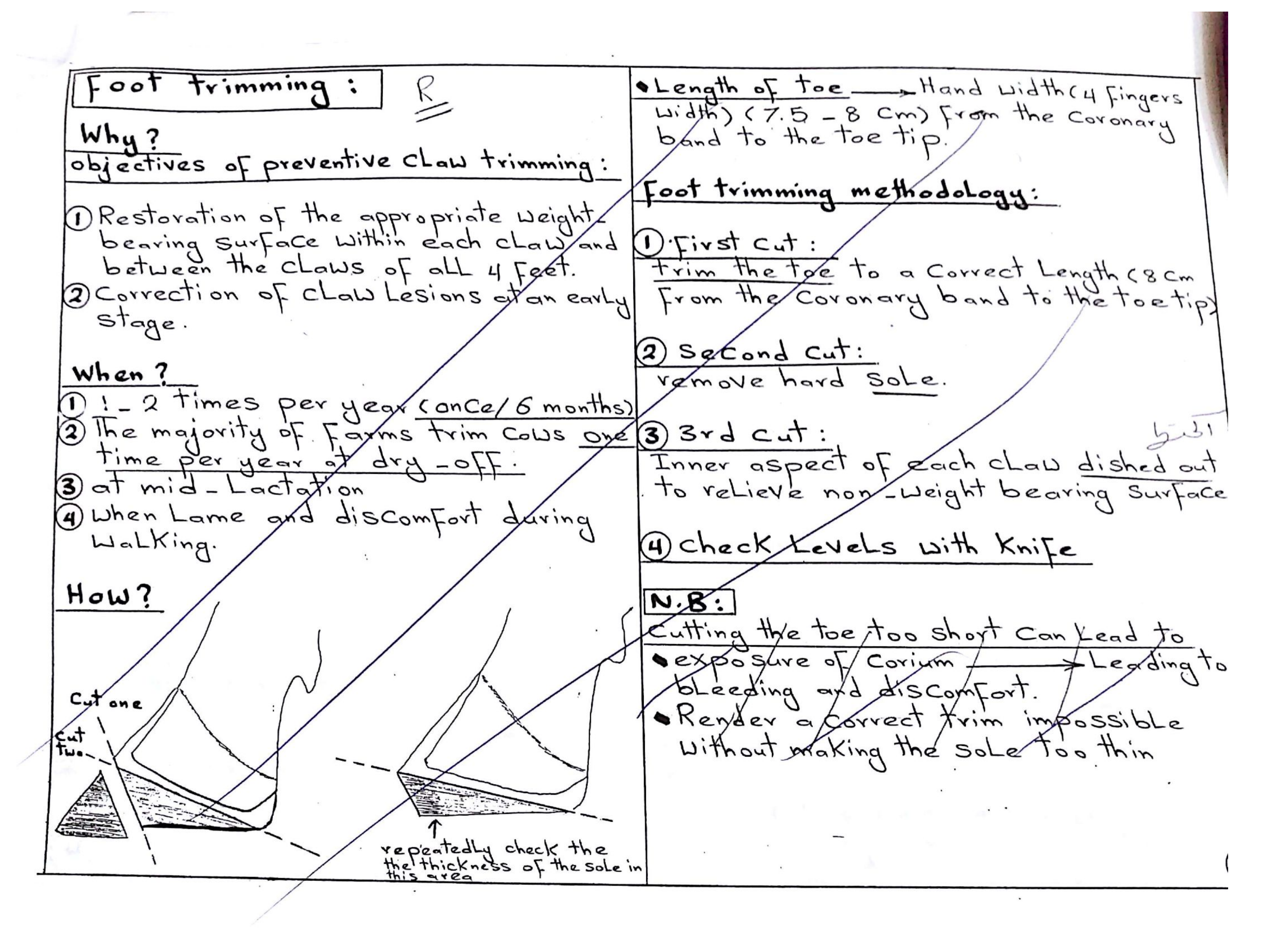
Hoof overgrowth

R

- **occur mainly at the toe:**
  - Toe is harder than heel, grows more rapidly and the rate of wear is less at the toe (weight-bearing is greater at the heel).
  - The end result:
    1- Lengthening and raising of the toe with a corresponding lowering of the heel.
    2- backward rotation of pedal bone with pinching of the corium at the typical ulcer site → Sole ulcer

- **also occur on the sole:**
  more horn produced on the sole of the weight bearing claws (Lateral claw of rear and medial claw of front feet)

Toe overgrowth



Foot trimming : R

Why?

objectives of preventive claw trimming:

1. Restoration of the appropriate weight bearing surface within each claw and between the claws of all 4 feet.
2. Correction of claw lesions at an early stage.

When?

1. 1 _ 2 times per year (once / 6 months)
2. The majority of farms trim cows one time per year at dry _ off.
3. at mid _ Lactation
4. when Lame and discomfort during walking.

How?

- Length of toe → Hand width (4 fingers width) (7.5 _ 8 Cm) from the Coronary band to the toe tip.

Foot trimming methodology:

1. First cut :
   trim the toe to a correct Length (8 Cm from the Coronary band to the toe tip)
2. Second cut:
   remove hard sole.
3. 3rd cut :
   Inner aspect of each claw dished out to relieve non _ weight bearing surface
4. check Levels with knife

N.B:

Cutting the toe too short can lead to

- exposure of Corium → Leading to bleeding and discomfort.
- Render a correct trim impossible without making the sole too thin

أوضار

② Interdigital hyperplasia

(chronic proliferative digital dermatitis or hairy heel warts or digital warts)

def. [illegible] — Exam

a proliferative reaction of interdigital skin.

Signs:

① If erosive lesions → foul odor and secondary infection

② proliferative mass → hairless, ulcerated secondary to pressure trauma, painless to palpation and foreign material present between the mass and axial border of the digit.

- Typically present at the dorsal aspect of the interdigital space along the coronary band. بين الصوابع لفوق منتشرة

- The hindlimbs are mostly affected

- affect one limb or all four limbs.

Treatment: Exam

① Surgical excision (Enbloc resection):

- IVRA or perilesional analgesia Intra venous Regional anasthesia..
- wedge-shaped excision on each side of the mass.
- Removal of all hyperplastic tissues
- Removal of interdigital fat.
- Control hemorrhage
- application of bandage

① The toes are wired together by drilling 2 holes through the hoof wall at point of toes → to fix the claw to facilitate healing.

- Systemic broad-spectrum antibiotic
- Removal of bandage after 5 days and replaced by another one for 5 days.

② Cryosurgery (freezing)

③ Electrocautery (burning)

④ Foot baths → not preferred

⑤ Topical antibiotic treatment with gauze soaked in oxytetracycline or lincomycin/spectinomycin combination under a bandage.

امراض وصديد ما بين الاصابع

3 Foot rot

(Interdigital necrobacillosis - Interdigital phlegmon - Infectious pododermatitis - foul in the foot - panaritium)

def. التهاب الجلد

acute or subacute inflammation of the interdigital skin and underlying tissues

Incidence:

- higher during the winter months and in confinement housed cattle
- affect also sheep and goat.
- Recently a new more severe form of the disease has been observed → called Super foul or Super foot rot.

Causes:

1. Fusobacterium necrophorum
   - anaerobic, Gram -ve bacterium
   - present in rumen and fecal matter
   - may work alone or in conjunction with Bacteroides melaninogenicus
2. Cuts, abrasions and punctures → facilitate entrance of aerobic bacteria as staph., strept. and Coryne. → Create anaerobic condition → good media for growth of the causative agent.

clinical signs:

1. swelling and erythema of interdigital space with claw separation.
2. The inflammation (interdigital phlegmon) may extend to the pastern and fetlock.
3. Sudden lameness (mostly only in one limb)
4. deeper complications as septic arthritis of coffin joint or tenosynovitis may occur in cattle (not in sheep or goat).
5. Interdigital space:
   - skin discolored.
   - sloughing or fissuring of skin and necrotic tissue.
   - exudate with foul odor

Systemic Reaction:

6. ↑ body temperature من الاعراض
7. Loss of appetite
8. Weight loss and ↓ milk yield in late stages.

diagnosis:

1. Symmetrical swelling
2. Foul smell
3. broken skin (ulcers) between toes.

Misdiagnosis:

1. digital dermatitis

superficial inflammation of interdigital epidermis

④ White Line disease

def.

abaxial or axial (Less Common) wall separation from Laminae at Sole-wall area extending proximally with cavity impacted with mud, feces or with development of abscess cavity at deepest part (abscessation).

- ch' by separation and penetration by infected debris of the fibrous junction between the sole and wall (white line) → often lead to abscessation.

Incidence:

- usually found in the abaxial white line, immediately distal to the bulb of the heel.
- The outer claw of the hind claw is usually affected.

Signs:

1. Moderate Lameness
2. white line is wider than normal.
3. early stage → pinpoint dark marks
   - Later → obvious foreign material impacted in white line.
4. separation is evident on paring.
5. No pain
6. white line abscess → pain and lameness.
7. Internal wall abscess without obvious tract distally.
8. Sensitive to pincers (hoof tester and hammer) pressure.
9. The site of entry appear as a dark area packed with extraneous debris on the surface of the sole (after paring away of the superficial layers of the solar horn).

Treatment:

1. paring away of the hoof wall adjacent to the abscessed area to ↓ weight-bearing at this site.
2. Careful paring out of the tract leading to the abscess.
3. Systemic broad-spectrum antibiotic for 3-5 days
4. application of foot block to the unaffected claw of the affected foot → this suspend weight bearing, ↓ discomfort and promote recovery of the damaged claw (hoof block wear off 2-4 wks → 2-3 m

أمراض

4 SoLe uLcer (Rüsterholz's uLcer)

def.

Exam

a CircumScribed Loss of the horny SoLe which exposes the Corium.

or

an area of damaged soLe horn which has CompLeteLy Lost the horn tissue except for the Corium.

- The Lesion is usually Located in the region of SoLe-buLb junction, near the axiaL than the abaxiaL margin of the hind outer cLaw.

Incidence:

- CommonLy affect one or both hind cLaws predominantLy in heavy, high yieLding dairy CattLe Kept under Confined Condition.
- In ForeLimbs → affect mediaL cLaw

EtioLogy:

The main Cause is unKnown

- probabLy resuLts from LocaLized damage to the Corium at the soLe-buLb junction.

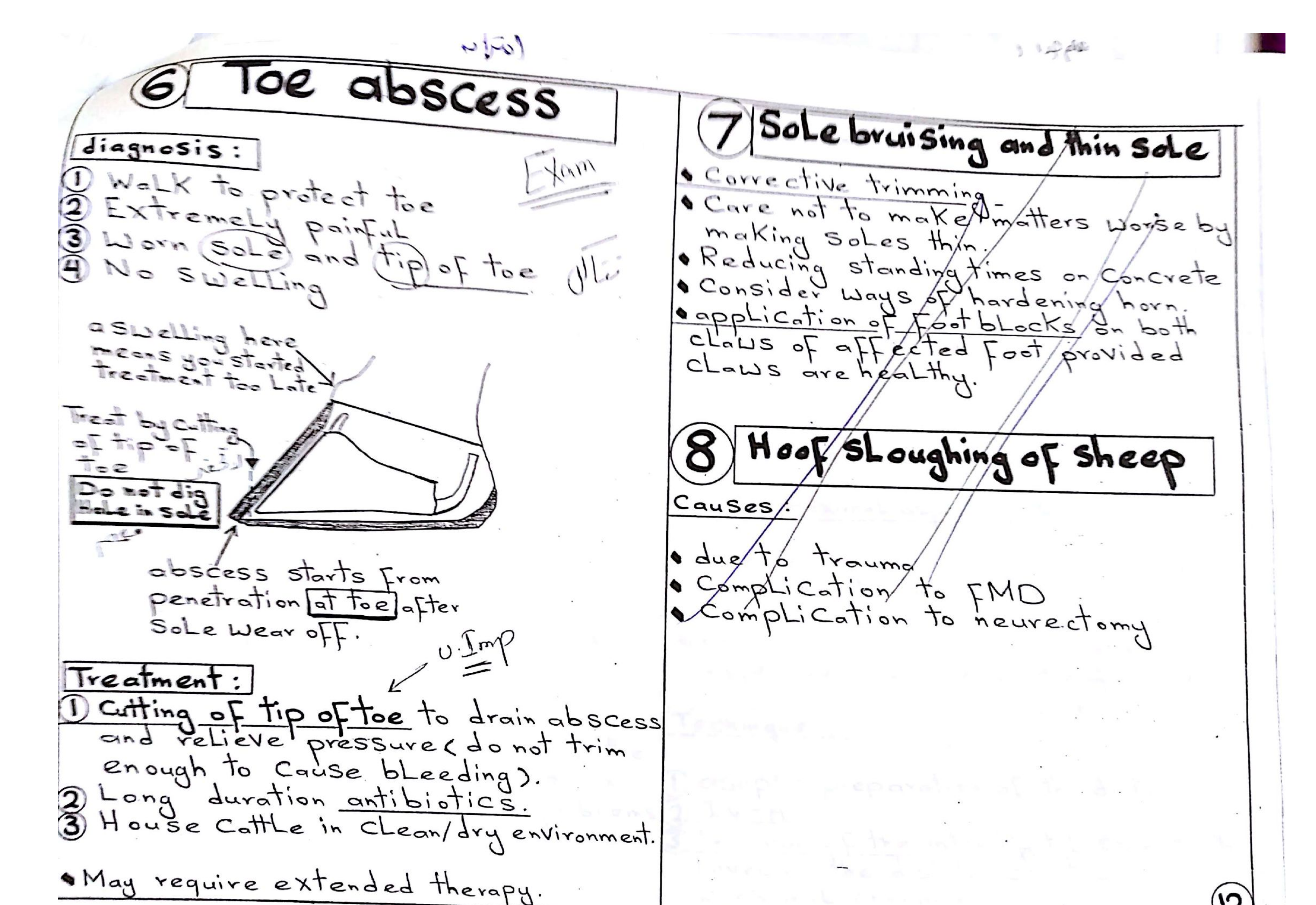
نقطة أولى

CLinicaL Signs:

1. Lameness is sudden in onset.
2. The Lesion is usuaLLy haLf inch in diameter, the soLe get weakened and the granuLating mass appeared through the uLceration (Mushroom-Like Lesion).
3. The Lesion varies from a soft sLightLy discoLored area which may be painfuL under pressure to an obvious CircumScribed Lesion.
4. paring the excessive horn → reveaLed hemorrhagic horn
5. abduction of the affected Limb with weight-bearing on the unaffected mediaL digit or on the toe. لو كان يحصل على ال lateral
6. BiLateraL affection: rest of the hindLimb and the animaL tends to Lie down more than normaL.

Treatment:

1. ReLieve the weight bearing on the affected cLaw → by removaL of the necrotic horn tissue
2. Hoof trimming to Correct the shape and size → Cause even distribution of the weight between the 2 cLaws → ↓ the Load on the soLe uLcer.



6 Toe abscess

Exam

diagnosis:

1. Walk to protect toe
2. Extremely painful
3. Worn sole and tip of toe
4. No swelling

Treatment:

u. Imp

1. Cutting of tip of toe to drain abscess and relieve pressure (do not trim enough to cause bleeding).
2. Long duration antibiotics.
3. House cattle in clean/dry environment.

- May require extended therapy.

7 Sole bruising and thin sole

- Corrective trimming.
- Care not to make matters worse by making soles thin.
- Reducing standing times on concrete
- Consider ways of hardening horn.
- application of foot blocks on both claws of affected foot provided claws are healthy.

8 Hoof sloughing of sheep

Causes:

- due to trauma
- Complication to FMD
- Complication to neurectomy

digit amputation

Indications:

treatment of incurable diseases of cattle digits such as:

1. deep sepsis of the digit
2. Chronic septic arthritis of DIP and PIP joints.
3. Vertical wall cracks with exuberant granulation tissue formation.
4. Severe trauma to toe and axial wall
5. White line lesions associated with recurring exuberant granulation tissue formation.

- production Longivity of cattle after digit amputation ⟶ 10 - 24 months.

advantages:

1. all or most infected tissues are removed and cattle usually return rapidly to production.
2. Rapid and inexpensive procedure.
3. It is a good treatment option if the affected animal is older and is a low producer or has other problems such as blind teats.

13

disadvantages:

1. ↓ production life
2. poor response of heavy animals.
3. poor cosmetic result.

sites of digit amputation:

1. below the coronary band, by disarticulation of the DIP joint.
   - disadv.: the articular cartilage does not granulate and may form a synovial cyst. عرو صامتم المفصل تتشكل
2. at the proximal aspect of the middle phalanx.
3. at the distal aspect of the proximal phalanx ⟶ the most common technique as it is:
   - Rapid and simple procedure
   - provide a wide resection and an effective drainage of the affected digi هيشيل كل الصديد الموجود فى الحافر

Technique:

1. aseptic preparation of the distal limb
2. IVRA
3. Incision of the interdigital skin to th level of the distal aspect of the proximal phalanx.

4) Insertion of an obstetric wire in the interdigital incision and placed at the distal aspect of the proximal phalanx axially and with angle of 45° to the proximal digit abaxially.

5) an assistant help to hold the digit to provide more stability during cutting.

6) during the amputation procedure, saline is poured on the wire to prevent overheating of the bone.

7) after amputation:

- resection of the interdigital fat.
- control hemorrhage
- debridement of necrotic tissue.
- application of bandage for 5 days then replaced.
- systemic broad-spectrum antibiotic for 3-5 days.

N.B:

Healing occur in 5-6 weeks.

prevention of claw affections

1) Selection of cows with acceptable claw conformation.
2) good housing
3) good hygienic measures
4) Monitoring lameness incidence and causes
5) prompt treatment of lame cows
6) specific management of first lactation cows
7) clean and comfortable walking surfaces for cows
8) a planned foot trimming program
9) strategic regular foot bathing

Foot bath:

- For dairy cattle → 2.2 m in length → 1.2 m in width → 20-30 cm in depth.

• Two Compartments:
- → the first → for washing
- → the second → for disinfection.

• The floor of foot bath should be Corrugated with Concrete ridges or metalic plates with 5_6 Cm distance between plates (this make claws to be apart from each others → good disinfection).

• disinfectant used:
- → $CuSO_4$ 5%
- → Formalin 5%

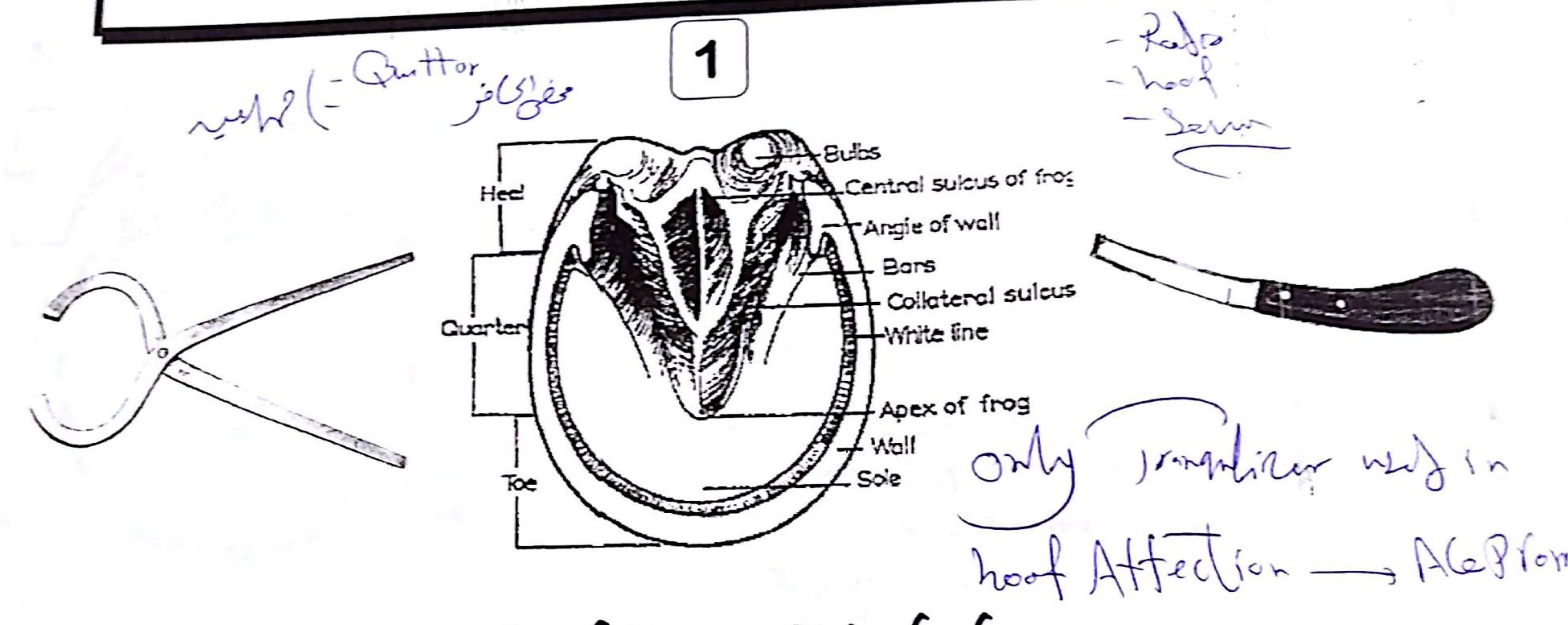
• changed every 500 - 800 Cows.

• If not available → spraying of interdigital space with $CuSO_4$ once/ week.

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Hoof Affections

1

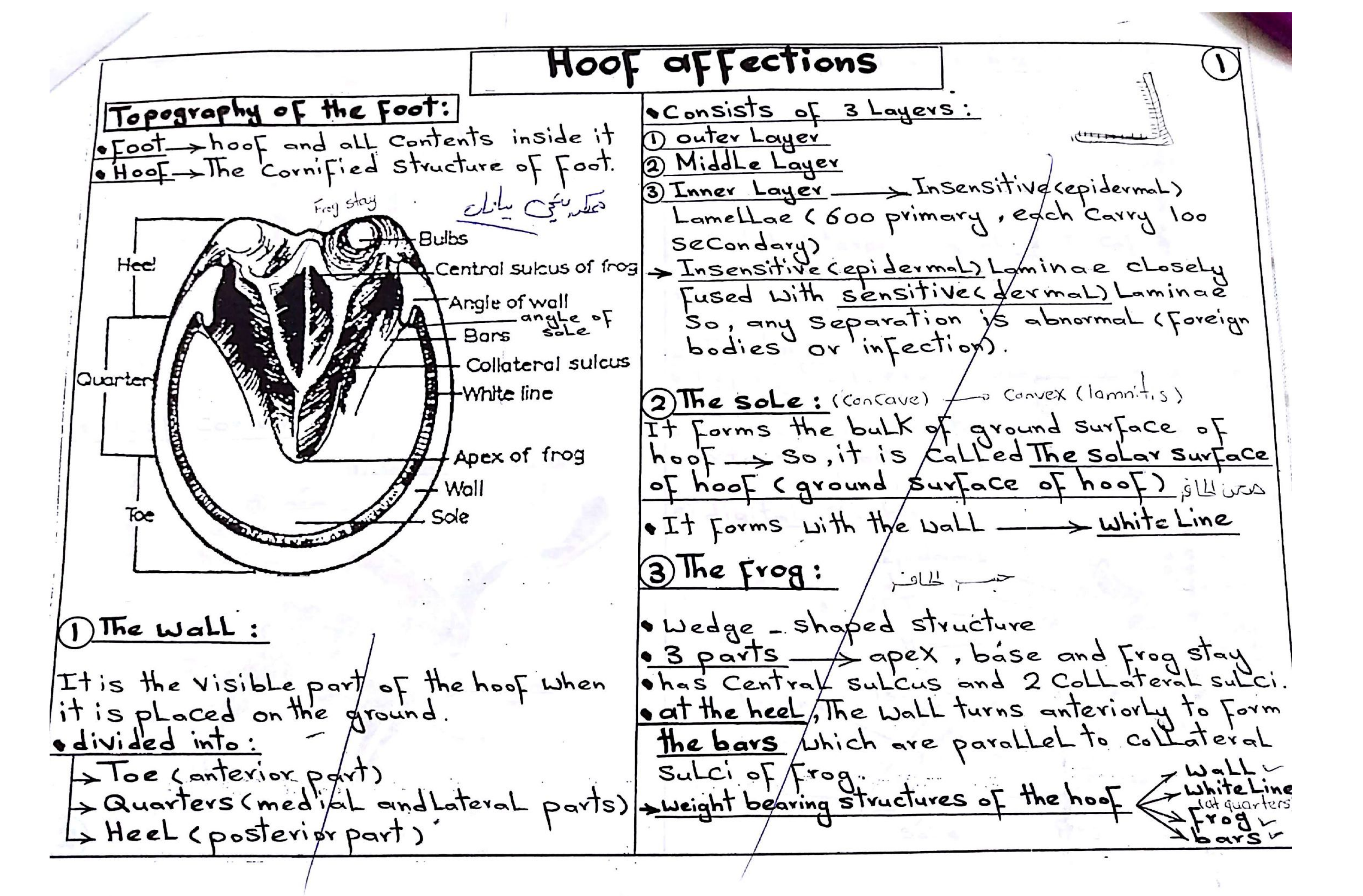


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Hoof affections

Topography of the foot:

- Foot → hoof and all contents inside it
- Hoof → The cornified structure of foot.

1) The wall:

It is the visible part of the hoof when it is placed on the ground.

- divided into:
  - → Toe (anterior part)
  - → Quarters (medial and lateral parts)
  - → Heel (posterior part)

- Consists of 3 layers:
  1. outer layer
  2. Middle layer
  3. Inner layer → Insensitive (epidermal) Lamellae (600 primary, each carry 100 secondary)

→ Insensitive (epidermal) Laminae closely fused with sensitive (dermal) Laminae So, any separation is abnormal (foreign bodies or infection).

2) The sole: (concave) → convex (laminitis)

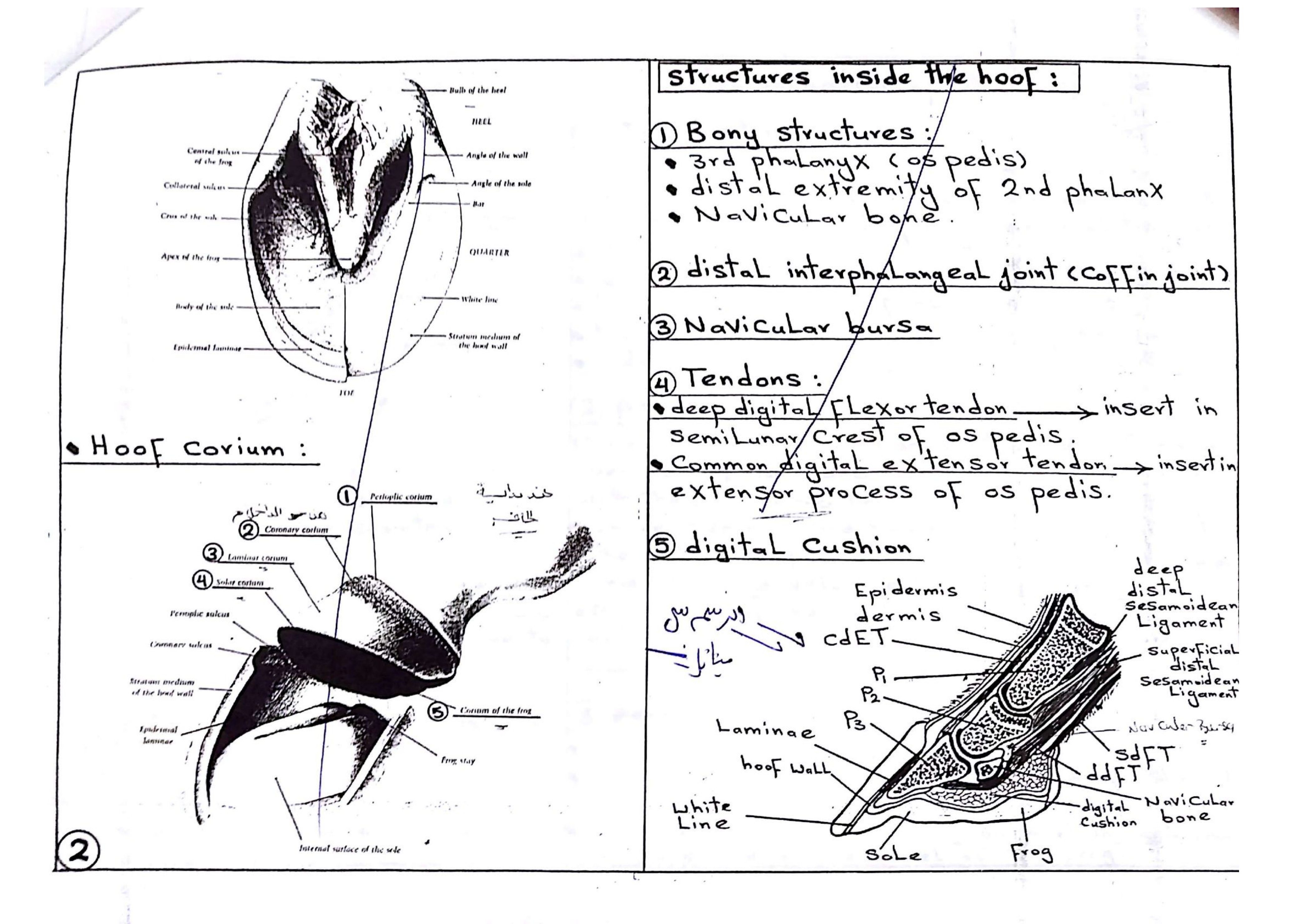
It forms the bulk of ground surface of hoof → so, it is called The solar surface of hoof (ground surface of hoof) صحن الحافر

- It forms with the wall → white Line

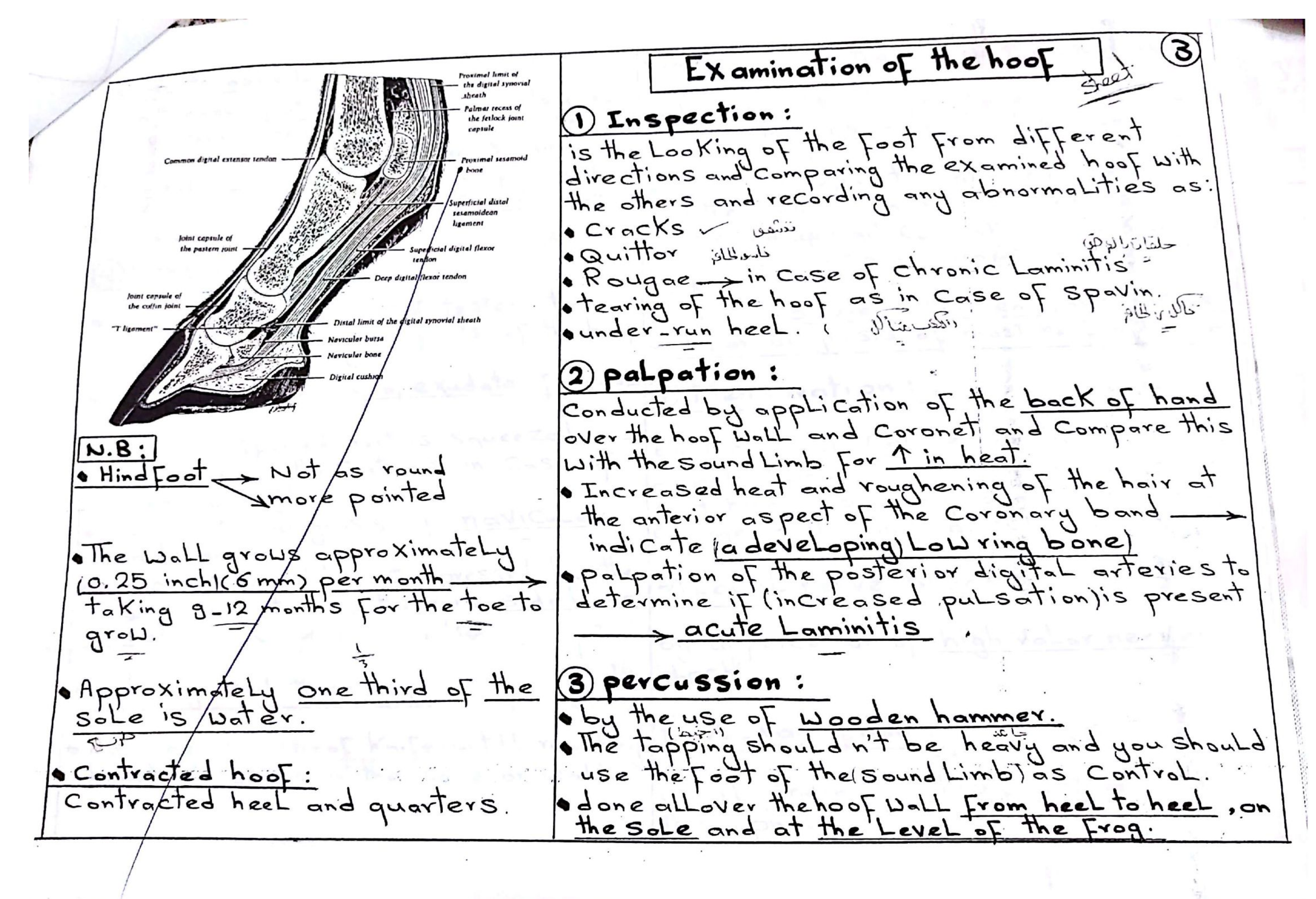
3) The frog: حسم الحافر

- Wedge-shaped structure
- 3 parts → apex, base and frog stay
- has central sulcus and 2 collateral sulci.
- at the heel, The wall turns anteriorly to form the bars which are parallel to collateral sulci of frog.

→ weight bearing structures of the hoof:
- wall ✓
- white Line (at quarters)
- frog ✓
- bars ✓



Bulb of the heel
HEEL
Central sulcus of the frog
Angle of the wall
Angle of the sole
Collateral sulcus
Bar
Crus of the sole
Apex of the frog
QUARTER
Body of the sole
White line
Stratum medium of the hoof wall
Epidermal laminae
TOE
• Hoof Corium :
① Perioplic corium
② Coronary corium
③ Laminar corium
④ Solar corium
Perioplic sulcus
Coronary sulcus
Stratum medium of the hoof wall
Epidermal laminae
⑤ Corium of the frog
Frog stay
Internal surface of the sole
2
Structures inside the hoof :
① Bony structures :
• 3rd phalanyx (os pedis)
• distal extremity of 2nd phalanx
• Navicular bone.
② distal interphalangeal joint (coffin joint)
③ Navicular bursa
④ Tendons :
• deep digital flexor tendon → insert in semilunar crest of os pedis.
• Common digital extensor tendon → insert in extensor process of os pedis.
⑤ digital cushion
Epidermis
dermis
CdET
P1
P2
P3
Laminae
hoof wall
White Line
Sole
Frog
digital Cushion
Navicular bone
ddFT
SdFT
Navicular Bursa
superficial distal sesamoidean Ligament
deep distal sesamoidean Ligament



Examination of the hoof

N.B:

- Hind foot → Not as round → more pointed
- The wall grows approximately (0.25 inch)(6 mm) per month → taking 9-12 months for the toe to grow.
- Approximately one third of the sole is water.
- Contracted hoof:

Contracted heel and quarters.

1) Inspection:

is the Looking of the foot from different directions and comparing the examined hoof with the others and recording any abnormalities as:

- Cracks
- Quittor
- Rougae → in case of chronic Laminitis
- tearing of the hoof as in case of spavin.
- under-run heel.

2) palpation:

Conducted by application of the back of hand over the hoof wall and coronet and compare this with the sound Limb for ↑ in heat.

- Increased heat and roughening of the hair at the anterior aspect of the coronary band → indicate (a developing) Low ring bone)
- palpation of the posterior digital arteries to determine if (increased pulsation) is present → acute Laminitis

3) percussion:

- by the use of wooden hammer.
- The tapping shouldn't be heavy and you should use the foot of the (sound Limb) as control.
- done allover the hoof wall from heel to heel, on the sole and at the Level of the Frog.

I) affections of The hoof WaLL

1) Sand Crack

عملی س — تشوهات حافر

def.

Fissures in the wall of the hoof, starting at the bearing surface of the wall and extending to a variable distance up the hoof wall. **or** Fissures originating at the coronary band as a result of a defect in the band and extending downwards.

- These cracks run parallel to the horny tubules in the wall.

occurance:

- In all farm animals, but it is of major importance in horses and cattle.
- In forelimbs → occur in quarters or heel
- In hindlimbs → occur in the toe.

Causes:

1) Hereditary → as inherent weakness in the horn which render it liable to cracking.
2) Alternative moisture and dryness → which makes the horn easy to crack.
3) Natural thinning of the horn or excessive rasping of the wall where the periople is removed leading to evaporation of moisture from the wall.
4) Lack of trimming of the feet → causes excessive growth of the hoof wall and its splitting.

Classification:

- acc. to its location on the wall:
  - Toe crack
  - quarter crack
  - Heel crack
- acc. to description of the lesion:
  1) Complete → extending through the whole length of the wall
  2) Incomplete → extending through a part of its length.
  3) Superficial → affect the superficial layer
  4) deep → passing through the whole thickness of the wall till reaching the laminar layer.
  5) Complicated → is a deep one associated with damage, necrosis or infection to the hoof structures.

Symptoms:

1) presence of cracks at hoof is the major clinical sign.
2) If superficial crack → No lameness
3) Lameness is evident if the crack extends into sensitive tissues with infection.

④ Lameness is of <u>standing type</u> → pain is evident when the body weight is placed on the affected limb.

⑤ Inflammatory discharge, blood and serum may come out from the crack esp. <u>the complicated type</u>. وارد تكون موس

diagnosis:

depends mainly on <u>presence of the crack</u> → so before examination of the hoof, It should be thoroughly washed by water and brush.

prognosis:

- <u>Favorable</u> → If the crack originates at the bearing surface of the wall and free from infection.
- <u>guarded to unfavorable</u> → if infection present.
- If the horn is <u>brittle</u> (هش) → cracking is able to reoccur. (كسر الحافر)

Treatment:

aim:

① reduce the mobility of the crack.
② relieve sepsis if present.
③ Control exuberant granulation if sensitive laminae are exposed. ← زوائد لحمية غزيرة

Treatment:

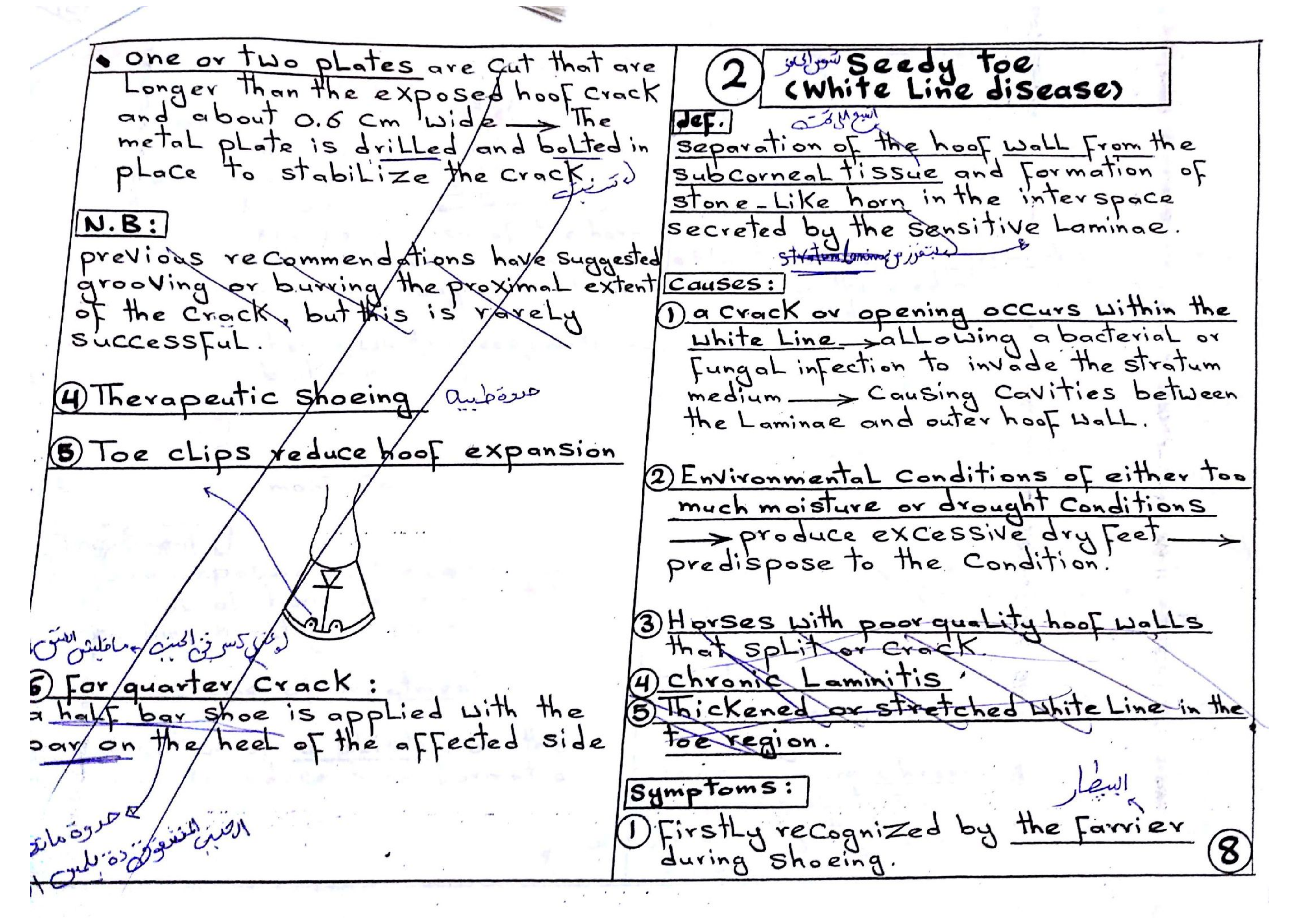
① <u>Exploration and debridement of the hoof crack with a hoof knife</u> to remove all necrotic and infected tissue.
← الكحت التشقق كويس جدًا وبس اططلع صبغة يود (بتنشف الحافر)

② <u>Treatment of the crack for several days with Tr. Iodine</u> until the sensitive structures begin to cornify (يجمد) and infection has resolved.
بعدما ينشف اططلع المادة اللي بتتحط في السناد ← مادة مالئة

③ <u>Filling of the hoof crack with acrylic material</u> → adhesion of the acrylic to the hoof wall is enhanced by using <u>a hair dryer</u> at the external hoof surface before acrylic application.

④ The hoof wall <u>must be stabilized</u> so that it can regrow.
← هجيب المسامير واثبتهم في الـ crack بالمسمار

- <u>The hoof shouldn't be desensitized</u> to allow the farrier and vet. to assess if there is inadvertent iatrogenic penetration of deeper tissues with the screws.
← قبل ما تركب الشرايح اوعى تخدر الحيوان علشان لو غلطت بالغلط تشوف الحيوان يحس
← دخلت غلط بالمسمار



- One or two plates are cut that are longer than the exposed hoof crack and about 0.6 cm wide → The metal plate is drilled and bolted in place to stabilize the crack.

N.B:

previous recommendations have suggested grooving or burring the proximal extent of the crack, but this is rarely successful.

(4) Therapeutic shoeing

(5) Toe clips reduce hoof expansion

(6) For quarter crack :
a half bar shoe is applied with the bar on the heel of the affected side

(2) Seedy toe (White Line disease)

Def.
Separation of the hoof wall from the subcorneal tissue and formation of stone-like horn in the interspace secreted by the sensitive laminae.

Causes:

1. a crack or opening occurs within the white line → allowing a bacterial or fungal infection to invade the stratum medium → causing cavities between the laminae and outer hoof wall.
2. Environmental conditions of either too much moisture or drought conditions → produce excessive dry feet → predispose to the condition.
3. Horses with poor quality hoof walls that split or crack.
4. Chronic laminitis
5. Thickened or stretched white line in the toe region.

Symptoms:

1. Firstly recognized by the farrier during shoeing.

③ These Lesions are chronic and do not heal.
④ Intermittent purulent discharge
⑤ Lameness occur in the acute stages but might show remission (يخف) when the Lesion appear to be healing.

diagnosis:

① clinical signs symptoms are typical

② Radiography (IV) [illegible]
after injection of a contrast medium or insertion of a flexible metal probe into the tract → to determine the depth and direction of the draining tracts.

③ differential diagnosis:

1- chronic ascending infection of the white line that breaks and drains at or slightly proximal to the coronary band.
→ Quittor → more diffuse swelling located more proximally over the collateral cartilage.

2- penetrating wound at coronary band:
- difficult to be drained
- not open by another sinuses
- severe degree of Lameness

prognosis:
- guarded
- Many cases respond favourably to treatment.
- Quittor in the hindlimb respond to treatment than the forelimbs because the Lateral cartilages are thinner in the hindlimbs.

Treatment:

① Irrigation of the tract with escharotic agent as 20% silver nitrate followed by saline solution (أفضل مادة كاوية علشان تحرق الغضاريف)

② Surgical removal of the necrotic cartilage → drainage
The Best ttt

Surgical excision and drainage
فتحة للغضروف Cartilage
فتحة لإزالة الصديد
مكان الـ [illegible]

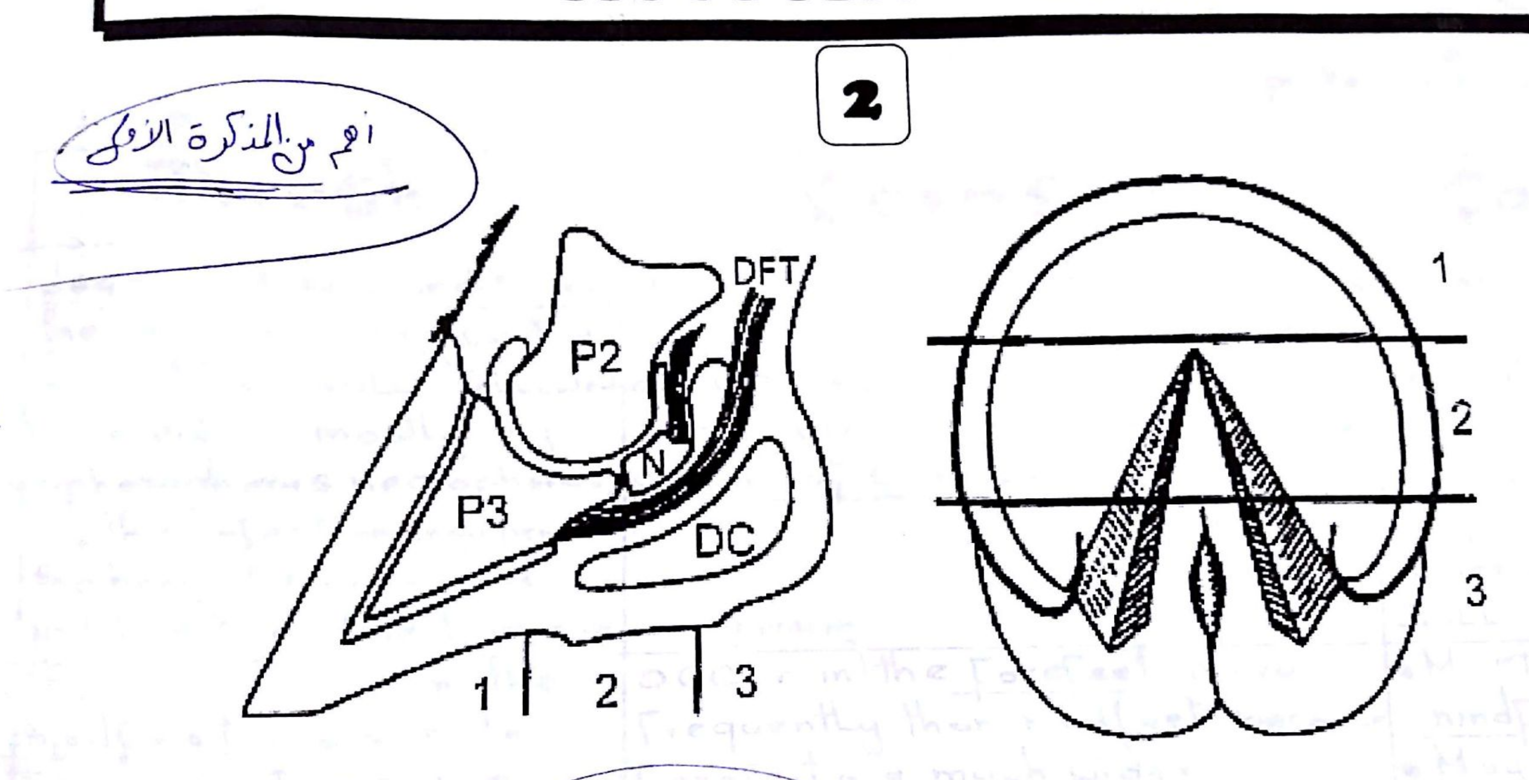
N.B: Sheet

Side bone:
ossification of the collateral cartilages of the 3rd phalanx
- usually found in the (forelimbs) and is more common in horses having (poor conformation)
- The cartilages of the coffin bone are:
1- hyaline → in young ages
2- fibrocartilage → in middle-aged animals
3- tend to ossify (calcify) forming sidebone → in older horses.

Hoof Affections

2

أهم من المذكرة الأولى

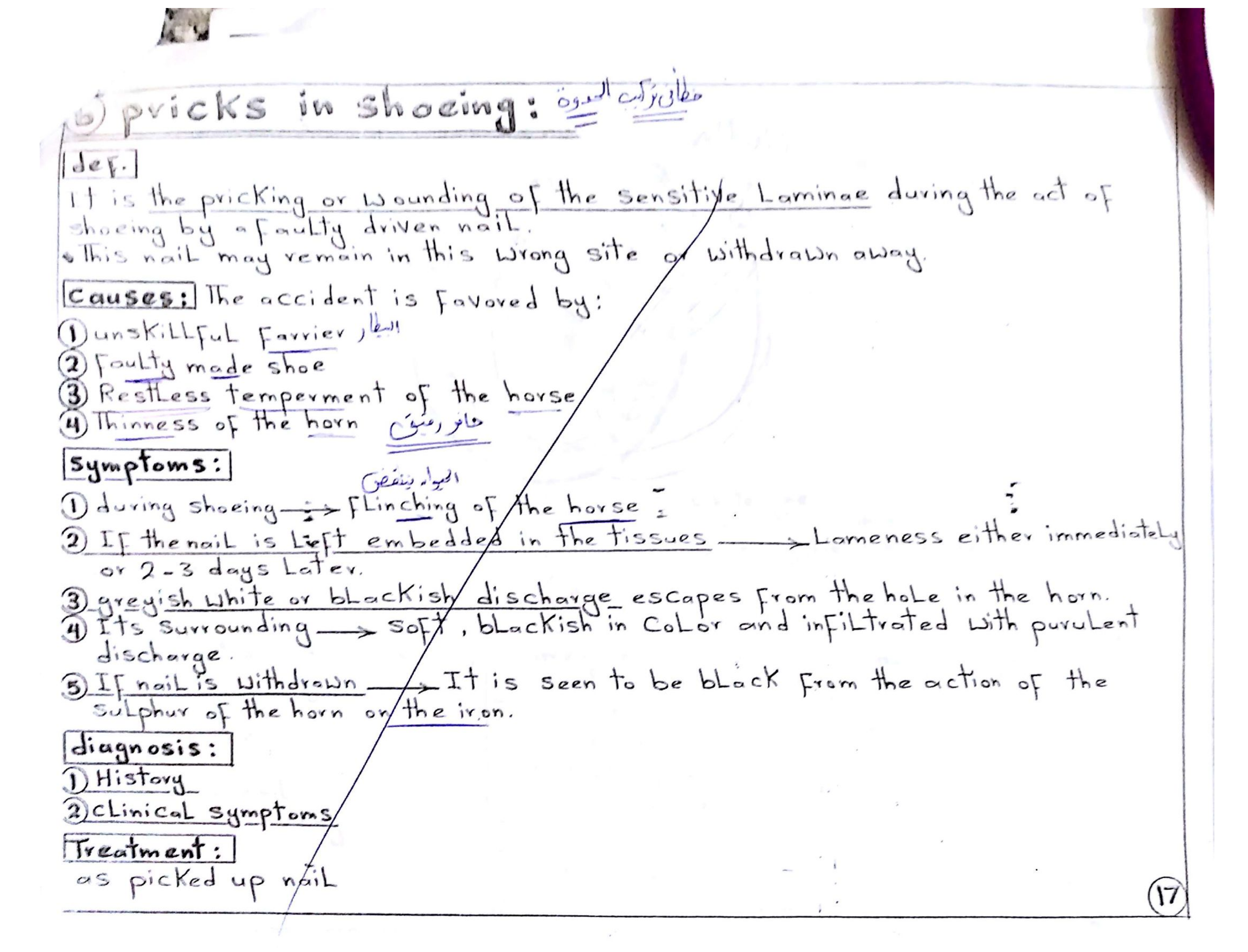


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6) pricks in shoeing: غلطات تركيب الحدوة

def.

It is the pricking or wounding of the sensitiye Laminae during the act of shoeing by a faulty driven nail.

- This nail may remain in this wrong site or withdrawn away.

Causes: The accident is favored by:

1. unskillful farrier البيطار
2. faulty made shoe
3. Restless temperment of the horse
4. Thinness of the horn حافر رقيق

Symptoms:

1. during shoeing → flinching of the horse الحيوان ينتفض
2. If the nail is left embedded in the tissues → Lameness either immediately or 2-3 days Later.
3. greyish white or blackish discharge escapes from the hole in the horn.
4. Its surrounding → soft, blackish in Color and infiltrated with purulent discharge.
5. If nail is withdrawn → It is seen to be black from the action of the sulphur of the horn on the iron.

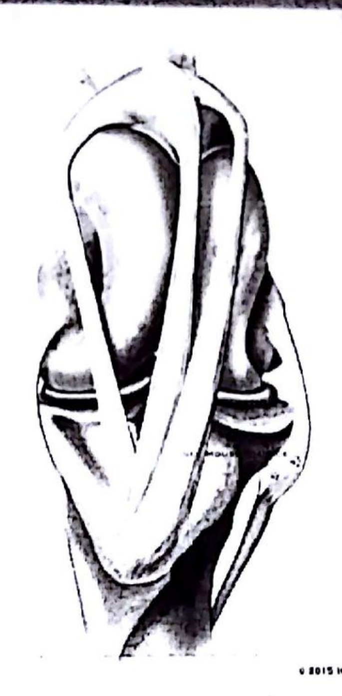
diagnosis:

1. History
2. clinical symptoms

Treatment:

as picked up nail

Stifle joint affections



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Stifle joint affections

Stifle joint affections:
- Gonitis
- upward fixation of the patella

I Gonitis

def.
Inflammation of stifle joint.

Causes: ع

1. chondromalacia of the patella
2. upward fixation of the patella (chronic)
3. sprain or rupture of collateral ligaments.
4. sprain or rupture of cruciate ligaments.
5. Trauma of joint capsule
6. damage or injury to menisci
7. Fracture of bony structures (patella, tibia or femur) due to severe trauma
8. osteochondrosis dessicans → aseptic necrosis of hyaline articular cartilage of distal extremity of femur.
9. septic arthritis

Clinical signs:

1. There is distension (due to effusion) and thickening of the joint capsule between middle and medial patellar ligaments.
2. pain during movement.
3. The animal will put as little weight as possible on the affected limb when moving or standing.
4. Suppurative arthritis → fever and severe degree of lameness (Non-weight bearing lameness).

diagnosis:

1. clinical signs
2. diagnostic analgesia
3. Radiography
4. ultrasonography
5. MRI
6. arthroscopy

II Upward fixation of the patella

def.

The patella get fixed above medial trochlear ridge of distal extremity of the femur.

Incidence:

- Common in buffaloes, cattle, equines (donkey, horse, mule) then camels.
- but in small ruminants, dogs, cats and human → not occur but may occur lateral or medial luxation of the patella due to:
  1. One patellar ligament
  2. Lateral and medial ridges of trochlea of femur are not prominent.
  3. The groove between 2 ridges is shallow.

Causes:

1. Hereditary predisposition:
   - straight hindlimb (wide angle between femur and tibia)
   - abnormal flattening of the medial condyle of the femur.
2. Laxity of the patellar ligaments.
3. debility and poor condition of the animal
4. Excessive abduction of both st[ifl]es by a massive udder of high mil[kin]g cow stretch the joint ligaments.
5. Repeated trauma and sprain th[e l]igaments when the limb overextended be[yon]d its physiological limits.

Clinical signs:

- Lameness is sudden in onset and it frequently affects both hindlimbs, although one limb is usually more severely involved.

- **Forms:**

1. **permanent form:**

1- Snatching movement of the limb continued for many steps during walking.

2- Rigid extension of the affected limb backwards and can not be flexed → the stifle and hock joints are extended while the phalangeal joints are flexed.

3- When the animal is forced to walk:

- draging the front of the claws or hoof of the extended limb on the ground.
- Circumduction of the whole limb.